

BUTLER -- 10/823,776  
Client/Matter: 081468-0309172

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently amended) A lithographic apparatus, comprising:  
an illumination system configured to provide a beam of radiation;  
a support configured to support a patterning device, the patterning device configured to impart the beam with a pattern in its cross-section;  
a substrate table configured to hold a substrate;  
a projection system configured to project the patterned beam onto a target portion of the substrate;  
a measurement system configured to generate an information signal including information about positions a position of at least one of either the patterning device, or the substrate, or the projection system, and components or a component of the projection system, or any combination thereof; and  
a control system configured to ~~control the positions and~~ transform the information signal into at least a native feedback signal representing an imaging characteristic of the lithographic apparatus, including at least one of focus, magnification and distortion, wherein the control system is said control system configured to generate a control signal on the basis of a native set-point signal and the native feedback signal, the control system controlling said position and control the positions on the basis of the control signal.
2. (Currently amended) A lithographic apparatus according to claim 1, wherein the control system comprises a native feedforward controller configured to generate a feedforward control signal on the basis of the native set-point signal ~~and to inject the feedforward signal in a control loop of the control system to control the positions~~ the control signal being determined by the feed forward control signal.
3. (Currently amended) A lithographic apparatus according to claim 1, ~~wherein the control system further comprises:~~  
~~a transformation unit configured to transform the information signal into the native feedback signal and wherein the lithographic apparatus further comprises~~ further comprising:

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an actuator configured to exert control forces on at least one of the support, the substrate table, ~~and the projection system, and/or a component of the projection system~~ on the basis of the control signal.

4. (Original) A lithographic apparatus according to claim 1, wherein the projection system comprises a first lens element having a first position and a second lens element having a second position, the respective first and second positions each controlled by the control system.
5. (Currently amended) A lithographic apparatus according to claim 1, wherein the ~~control~~ control system comprises a native controller, said native controller comprising a ~~single-in-single-out~~ single-input-single-output controller.
6. (Currently amended) A lithographic apparatus according to claim 5, wherein the native controller comprises a second ~~single-in-single-out~~ single-input-single-output controller configured to ~~generates~~ generate a second control signal, wherein the ~~single-in-single-out controller corresponding to a selected native coordinate has the largest bandwidth of the respective controllers is chosen according to the relative weight of the native coordinates.~~
7. (Currently amended) A lithographic apparatus according to claim 5, wherein the native controller comprises a ~~multiple-in-multiple-out~~ multiple-input-multiple-output controller configured to generate at least two control signals.
8. (Original) A lithographic apparatus according to claim 1, wherein the control system comprises a conventional controller configured to operate on conventional coordinates, and a native controller connected in cascade with the conventional controller.
9. (Currently amended) A control system for a lithographic apparatus including an illumination system configured to provide a beam of radiation; a support configured to support a patterning device, the patterning device configured to impart the beam with a pattern in its cross-section; a substrate table configured to hold a substrate; a projection system configured to project the patterned beam onto a target portion of the substrate; a measurement system configured to generate an information signal including information

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~~about positions~~ a position of at least one of either the patterning device, or the substrate, or the projection system, or a component of the projection system, or any combination thereof, and components therein, wherein the control system is configured to control the positions and transform the information signal into at least a native feedback signal representing an imaging characteristic including at least one of focus, magnification and distortion, the control system comprising:

a controller configured to transform the information signal into at least a native feedback signal representing an imaging characteristic of the lithographic apparatus, said controller configured to generate a control signal on the basis of a native set-point signal and a native feedback signal, said controller controlling said position ~~and control the positions~~ on the basis of the control signal.

10. (Currently amended) A device manufacturing method for manufacturing a device with a lithographic apparatus, the method comprising:

projecting a patterned beam of radiation onto a target portion of a substrate;

generating an information signal including information about ~~positions~~ a position of at least one of either a patterning device used to pattern the beam of radiation, ~~the~~ or a substrate, or a projection system used to project the patterned beam, and components or a component of the projection system, or any combination thereof;

~~controlling the positions by:~~

transforming the information signal into at least a native feedback signal representing an imaging characteristic of the lithographic apparatus ~~including at least one of focus, magnification and distortion;~~

generating a control signal on the basis of a native set-point signal and the native feedback signal; and

~~controlling the positions~~ said position on the basis of the control signal.

11. (Currently amended) A method according to claim 10, further comprising:

exerting control forces on at least one of a support for the patterning device, a substrate table for the substrate, ~~[[and]]~~ the projection system and/or a component of the projection system.

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12. (Original) A method according to claim 10, wherein the projection system includes a first lens element having a first position and a second lens element having a second position, the method further comprising:  
controlling the first and second positions.
13. (New) A lithographic apparatus according to claim 1, wherein the imaging characteristic may include at least one of focus, magnification and/or distortion.
14. (New) A controls system according to claim 9, wherein the imaging characteristic may include at least one of focus, magnification and/or distortion.
15. (New) A method according to claim 10, wherein the imaging characteristic may include at least one of focus, magnification and/or distortion.